

# 6<sup>th</sup> Grade Science Curriculum Guide

<b>Course Name:</b> 6 <sup>th</sup> Grade Science		<b>Strand:</b> Scientific Inquiry
<b>Unit Title:</b> Scientific Inquiry		<b>Number of Days:</b> 7
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"><li>• Students will list and describe the steps of the scientific method.</li><li>• Students will identify parts of the scientific method in an experiment.</li><li>• Students will develop a hypothesis for a scientific problem.</li><li>• Students will carry out an experiment following a given procedure.</li><li>• Students will collect and display data from an experiment.</li><li>• Students will interpret observations to make logical inferences.</li><li>• Students will formulate a conclusion based on data collected during an experiment.</li></ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b> <ul style="list-style-type: none"><li>• BrainPop video and resources about the scientific method <a href="http://www.brainpop.com/science/scientificinquiry/">http://www.brainpop.com/science/scientificinquiry/</a></li><li>• “Process and Lab Skills” section of McDougal Littell Lab Manual</li><li>• MythBusters episodes show hypotheses being tested. “101 Uses for Cola” episode on Discovery: <a href="http://player.discoveryeducation.com/views/hh_httpView.cfm?guidAssetId=4aab2af6-b242-439b-bfbc-15670afe09c5">http://player.discoveryeducation.com/views/hh_httpView.cfm?guidAssetId=4aab2af6-b242-439b-bfbc-15670afe09c5</a></li></ul> <p style="text-align: center;"><i>See Science Wiki for documents and more activities/resources</i></p>
Pre-Assessment: <ul style="list-style-type: none"><li>• Student groups arrange parts of scientific method listed on index cards in sequential order</li></ul>	Informal Assessment: <ul style="list-style-type: none"><li>• Vocabulary Quiz</li><li>• Lab report on findings of class experiment</li></ul>	
Post-Assessment: <ul style="list-style-type: none"><li>• Scientific Method Test</li><li>• 1<sup>st</sup> Quarter Assessment</li></ul>		
<b>Essential Vocabulary:</b> problem, hypothesis, procedure, variable, constant, data, results, conclusions, observation, inference		

<b>Course Name:</b> 6 <sup>th</sup> Grade Science		<b>Strand:</b> Physical Science: Matter
<b>Unit Title:</b> Matter		<b>Number of Days:</b> 30
<b>Essential Standard:</b> 6.P.2 – Understand the structure, classifications, and physical properties of matter.		
<b>Clarifying Objective:</b> 6.P.2.1: <b>Atoms:</b> Recognize that all matter is made up of atoms and atoms of the same element are alike, but are different from the atoms of other elements. (7)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"> <li>Students will remember that all substances, including air, take up space and have mass. (3<sup>rd</sup> grade)</li> <li>Students will define matter.</li> <li>Students will recognize that all matter is made of atoms.</li> <li>Students will compare atoms to elements.</li> <li>Students will recognize that atoms of the same element have the same properties.</li> <li>Students will recognize that atoms of different elements have different properties.</li> </ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b>
<b>Pre-Assessment:</b> <ul style="list-style-type: none"> <li>Brainstorm smallest objects students can think of</li> <li>List items that can only be seen with a microscope</li> <li>Describe prior knowledge of atoms</li> </ul>	<b>Informal Assessment:</b> <ul style="list-style-type: none"> <li>Diagram relationship between atoms, molecules, and elements</li> <li>Create graphic organizer about the properties of a specific element</li> <li>Math Connection – use scientific notation to display size/mass of atoms</li> <li>Report on discovery/uses of specific element of periodic table</li> </ul>	<ul style="list-style-type: none"> <li>Interactive periodic table <a href="http://www.ptable.com/">http://www.ptable.com/</a></li> <li>Chem4Kids website has tutorials and interactive quizzes <a href="http://www.chem4kids.com/files/matter_intro.html">http://www.chem4kids.com/files/matter_intro.html</a></li> <li>Discovery Ed virtual lab on atoms <a href="http://streaming.discoveryeducation.com/braingame/s/iknowthat/ScienceIllustrations/atoms/science_desk.cfm">http://streaming.discoveryeducation.com/braingame/s/iknowthat/ScienceIllustrations/atoms/science_desk.cfm</a></li> <li>BrainPop videos and lessons on matter <a href="http://www.brainpop.com/science/matterandchemistry/">http://www.brainpop.com/science/matterandchemistry/</a></li> <li>The Atoms Family at <a href="http://www.miamisci.org/af/sln">http://www.miamisci.org/af/sln</a> relates atoms to matter</li> </ul> <p style="text-align: center;"><i>See Science Wiki for documents and more activities/resources</i></p>

Post-Assessment: <ul style="list-style-type: none"> <li>• Atoms Test</li> <li>• Matter Unit Test</li> <li>• 1<sup>st</sup> Quarter Assessment</li> </ul>		
<b>Essential Vocabulary:</b> matter, atom, element, molecule, compound, mixture, solution, property		
<b>Clarifying Objective: 6.P.2.2: Phases of Matter:</b> Explain the effect of heat on the motion of atoms through a description of what happens to particles during a change in phase. (7)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"> <li>• Students will remember the basic properties of the states of matter. (3<sup>rd</sup> Grade)</li> <li>• Students will recognize that atoms are in constant motion.</li> <li>• Students will describe the motion of atoms of in each state of matter.</li> <li>• Students will examine the effect of heat on the motion of atoms.</li> </ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b>
Pre-Assessment: <ul style="list-style-type: none"> <li>• Categorize example objects based on state of matter</li> </ul>	Informal Assessment: <ul style="list-style-type: none"> <li>• Create a poster that illustrates the flow of energy through changes in states of matter</li> <li>• Writing Connection – write a creative story about a water molecule going through the states of matter</li> <li>• Math Connection – graph the change in temperature of ice melting or water boiling</li> </ul>	<ul style="list-style-type: none"> <li>• BrainPop videos and lessons on matter and phase changes  <a href="http://www.brainpop.com/science/matterandchemistry/matterchangingstates/">http://www.brainpop.com/science/matterandchemistry/matterchangingstates/</a> </li> <li>• Enchanted Learning phases of matter worksheets  <a href="http://www.enchantedlearning.com/physics/Phasesofmatter.shtml">http://www.enchantedlearning.com/physics/Phasesofmatter.shtml</a> </li> <li>• Scholastic.com site for video on phase change, song, vocabulary and interactive quiz  <a href="http://teacher.scholastic.com/activities/studyjams/matter_states">http://teacher.scholastic.com/activities/studyjams/matter_states</a> </li> <li>• Discovery Ed virtual lab on states of matter  <a href="http://streaming.discoveryeducation.com/braingames/iknowthat/ScienceIllustrations/matter/science_desk.cfm">http://streaming.discoveryeducation.com/braingames/iknowthat/ScienceIllustrations/matter/science_desk.cfm</a> </li> </ul>

Post-Assessment: <ul style="list-style-type: none"> <li>States of Matter Test</li> <li>Matter Unit Test</li> <li>1<sup>st</sup> Quarter Assessment</li> </ul>		<ul style="list-style-type: none"> <li>Boil water inside of an empty soda can, flip it over quickly into a bowl of ice to see the sides cave in as the air molecules move closer together</li> </ul> <p><i>See Science Wiki for documents and more activities/resources</i></p>
<b>Essential Vocabulary:</b> particle, solid, liquid, gas, plasma, kinetic energy, heat, temperature, melting, freezing, vaporization, condensation, sublimation		
<b>Clarifying Objective: 6.P.2.3: Physical Properties of Matter:</b> Compare the physical properties of pure substances that are independent of the amount of matter present including density, melting point, boiling point, and solubility to properties that are dependent on the amount of matter present to include volume, mass and weight. (10)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"> <li>Students will remember that matter has measurable and observable properties. (5<sup>th</sup> Grade)</li> <li>Students will define and compare the chemical and physical properties of matter.</li> <li>Students will recognize that certain physical properties of matter are not dependent on the amount of matter present.</li> <li>Students will recognize that certain physical properties of matter are dependent on the amount of matter present.</li> <li>Students will identify and investigate the physical properties of matter.</li> </ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b> <ul style="list-style-type: none"> <li>Demonstrate chemical change with baking soda in balloon placed on water bottle containing vinegar</li> <li>Demonstrate physical change by adding food coloring to vinegar used in above experiment</li> <li>Experiment with the solubility of various solutes/solvents on a small scale using chemplates</li> <li>BrainPop video and lesson on property changes <a href="http://www.brainpop.com/science/matterandchemistry/propertychanges/">http://www.brainpop.com/science/matterandchemistry/propertychanges/</a></li> </ul>
Pre-Assessment: <ul style="list-style-type: none"> <li>Categorize examples of changes as chemical or physical</li> <li>List ways that observations can be made</li> </ul>	Informal Assessment: <ul style="list-style-type: none"> <li>Vocabulary Quiz</li> <li>Create a chart of properties of matter and how each is measured/observed</li> <li>Sort examples of physical properties by ones that depend on amount and ones</li> </ul>	

	<p>that don't</p> <ul style="list-style-type: none"> <li>Math Connection – measure the mass and volume of various objects and then calculate their densities</li> </ul>	<ul style="list-style-type: none"> <li>SAS virtual lab about density: <a href="http://www.sascurriculumpathways.com/portal/Launch?id=11">http://www.sascurriculumpathways.com/portal/Launch?id=11</a></li> <li>Reekoscience.com for experiments on density using Reeko's Mad Scientist Lab <a href="http://reekoscience.com/Experiments/#Floatation">http://reekoscience.com/Experiments/#Floatation</a></li> <li>Website for interactive on melting and boiling points <a href="http://harcourtschool.com/activity/hotplate/index.html">http://harcourtschool.com/activity/hotplate/index.html</a></li> </ul> <p><i>See Science Wiki for documents and more activities/resources</i></p>
Post-Assessment:	<ul style="list-style-type: none"> <li>Properties of Matter Test</li> <li>Matter Unit Test</li> <li>1<sup>st</sup> Quarter Assessment</li> </ul>	
<b>Essential Vocabulary:</b> physical property, chemical property, density, mass, volume, boiling point, temperature, freezing point, condensation, solubility, solute, solvent		

<b>Course Name:</b> 6 <sup>th</sup> Grade Science		<b>Strand:</b> Physical Science: Energy
<b>Unit Title:</b> Energy & Waves		<b>Number of Days:</b> 14
<b>Essential Standard:</b> 6.P.3 – Understand characteristics of energy transfer and interactions of matter and energy.		
<b>Clarifying Objective:</b> 6.P.3.1: <b>Energy Transfer:</b> Illustrate the transfer of heat energy from warmer objects to cooler ones using examples of conduction, radiation and convection and the effects that may result. (5)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"> <li>Students will remember that energy can be transferred from warmer objects to cooler ones. (3<sup>rd</sup> Grade)</li> <li>Students will remember the basic forms of energy. (4<sup>th</sup> Grade)</li> <li>Students will remember the effects of heat transfer. (5<sup>th</sup> Grade)</li> <li>Students will describe energy and how it travels.</li> <li>Students will explain how energy is transferred from one object to another.</li> <li>Students will understand that energy can change forms, but is never lost.</li> <li>Students will compare how heat is transferred through conduction, convection, and radiation.</li> </ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b>
<b>Pre-Assessment:</b> <ul style="list-style-type: none"> <li>Recall forms and uses of energy</li> </ul>	<b>Informal Assessment:</b> <ul style="list-style-type: none"> <li>Vocabulary Quiz</li> <li>Thinking map of forms of energy</li> <li>Diagram energy conversions involved in a common activity</li> <li>Identify types of heat transfers</li> <li>Math Connection – measure temperatures and convert between temperature scales</li> <li>Social Studies Connection – report</li> </ul>	<ul style="list-style-type: none"> <li>Energy Kids website: <a href="http://www.eia.gov/kids/">http://www.eia.gov/kids/</a></li> <li>Energy resource website: <a href="http://www.neok12.com/Energy-Sources.htm">http://www.neok12.com/Energy-Sources.htm</a></li> <li>Spigot Science Magazine about energy: <a href="http://spigotsciencemag.com/spigot-issues/energy">http://spigotsciencemag.com/spigot-issues/energy</a></li> <li>BrainPop videos and lessons on Energy <a href="http://www.brainpop.com/science/energy/">http://www.brainpop.com/science/energy/</a></li> </ul> <p><i>See Science Wiki for documents and more activities/resources</i></p>

	on the scientists responsible for the common temperature scales	
Post-Assessment: <ul style="list-style-type: none"> <li>• Energy Test</li> <li>• Energy and Waves Unit Test</li> <li>• 2<sup>nd</sup> Quarter Assessment</li> </ul>		
<b>Essential Vocabulary:</b> heat, temperature, thermal, degree, Fahrenheit, Celsius, equilibrium, conduction, convection, radiation		
<b>Clarifying Objective: 6.P.3.3: Technological Design:</b> Explain the suitability of materials for use in technological design based on a response to heat (to include conduction, expansion, and contraction) and electrical energy (conductors and insulators). (5)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"> <li>• Students will remember that heating and cooling affects some materials. (5<sup>th</sup> Grade)</li> <li>• Students will define and compare conductors and insulators.</li> <li>• Students will identify materials that act as conductors.</li> <li>• Students will identify materials that act as insulators.</li> <li>• Students will recognize that most materials expand when heated and contract when cooled.</li> <li>• Students will compare and analyze the amounts of expansion and contraction of various materials.</li> <li>• Students will evaluate the suitability of materials for use in technological design based on response to heat.</li> </ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b>
Pre-Assessment: <ul style="list-style-type: none"> <li>• Brainstorm materials that keep substances warm/cold</li> </ul>	Informal Assessment: <ul style="list-style-type: none"> <li>• Vocabulary Quiz</li> <li>• Categorize example materials as being conductors or insulators</li> <li>• Conductors/ Insulators Lab</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate expansion of object when heated, contraction when cooled, such as with a brass ball and ring set</li> <li>• Create a circuit with a light bulb and battery to demonstrate that materials that conduct electricity will complete the circuit and light the bulb</li> </ul>

	<ul style="list-style-type: none"> <li>Math Connection – graph temperature change of a material that conducts compared to one that insulates</li> </ul>	<ul style="list-style-type: none"> <li>"Too Hot to Handle" Virtual Lab:  <a href="http://scienceofeverydaylife.discoveryeducation.com/students/">http://scienceofeverydaylife.discoveryeducation.com/students/</a> </li> </ul> <p><i>See Science Wiki for documents and more activities/resources</i></p>
Post-Assessment:	<ul style="list-style-type: none"> <li>Energy Test</li> <li>Energy and Waves Unit Test</li> <li>2<sup>nd</sup> Quarter Assessment</li> </ul>	
<b>Essential Vocabulary:</b> expansion, contraction, conductor, insulator		



<b>Course Name:</b> 6 <sup>th</sup> Grade Science		<b>Strand:</b> Physical Science: Forces & Motion - Waves
<b>Unit Title:</b> Waves & Energy		<b>Number of Days:</b> 27
<b>Essential Standards:</b> 6.P.1 – Understand the properties of waves and the wavelike properties of energy in earthquakes light and sound waves. 6.P.3 – Understand characteristics of energy transfer and interactions of matter and energy.		
<b>Clarifying Objective:</b> <b>6.P.1.1: Properties of Waves:</b> Compare the properties of waves to the wavelike property of energy in earthquakes, light and sound. (4)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"> <li>• Students will understand that waves transfer energy, not matter.</li> <li>• Students will recognize that a force is required to start a wave.</li> <li>• Students will describe how energy travels through waves.</li> <li>• Students will compare the basic types of waves.</li> <li>• Students will illustrate and measure the properties of waves.</li> <li>• Students will compare the properties of waves in matter, light and sound.</li> </ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b>
<b>Pre-Assessment:</b> <ul style="list-style-type: none"> <li>• Name types of waves and describe their motions</li> </ul>	<b>Informal Assessment:</b> <ul style="list-style-type: none"> <li>• Vocabulary Quiz</li> <li>• Math Connection – measure and graph wave properties such as wavelength and amplitude</li> <li>• Social Studies Connection – report on the effects of Tsunamis</li> <li>• Diagram a wave and label its main parts</li> </ul>	<ul style="list-style-type: none"> <li>• Rope demonstration of transverse waves / slinky demonstration of longitudinal waves</li> <li>• Clear tank/container of water to demonstrate waves interacting with materials</li> <li>• Simulations on Classzone of forces and waves  <a href="http://www.classzone.com/books/ml_science_share/vis_sim/wslm05_pg7_force/wslm05_pg7_force.html">http://www.classzone.com/books/ml_science_share/vis_sim/wslm05_pg7_force/wslm05_pg7_force.html</a> and wave graphing  <a href="http://www.classzone.com/books/ml_science_share/vis_sim/wslm05_pg18_graph/wslm05_pg18_graph.html">http://www.classzone.com/books/ml_science_share/vis_sim/wslm05_pg18_graph/wslm05_pg18_graph.html</a> </li> </ul>

Post-Assessment: <ul style="list-style-type: none"> <li>• Waves and Sound Test</li> <li>• Energy and Waves Unit Test</li> <li>• 2<sup>nd</sup> Quarter Assessment</li> </ul>		<ul style="list-style-type: none"> <li>• BrainPop video and lesson on waves <a href="http://www.brainpop.com/science/energy/waves/">http://www.brainpop.com/science/energy/waves/</a></li> <li>• Bill Nye videos: <a href="http://www.gamequarium.org/dir/SqoolTube_Videos/Science/Bill_Nye_Videos/">http://www.gamequarium.org/dir/SqoolTube_Videos/Science/Bill_Nye_Videos/</a></li> <li>• Interactives and visuals of waves <a href="http://www.aktsunami.com/multimedia.html">http://www.aktsunami.com/multimedia.html</a></li></ul> <p><i>See Science Wiki for documents and more activities/resources</i></p>
<b>Essential Vocabulary:</b> longitudinal, transverse, wavelength, amplitude, crest, trough, frequency		
<b>Clarifying Objective: 6.P.1.3: Sound:</b> Explain the relationship between the rate of vibration, the medium through which vibrations travel, sound and hearing. (5)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"> <li>• Students will explain how vibrations of matter create sound.</li> <li>• Students will identify the characteristics of waves that determine the properties of sound.</li> <li>• Students will describe the process by which the human vocal chords produce sound.</li> <li>• Students will identify the structures in the human ear that perceive sound.</li> <li>• Students will analyze how the quality of sound changes as it travels through different materials.</li> </ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b> <ul style="list-style-type: none"> <li>• Tuning forks / hollow tubing / rubber bands stretched across tissue boxes to demonstrate sounds</li> <li>• Website for interactive sound tool: <a href="http://tonematrix.audiotool.com/">http://tonematrix.audiotool.com/</a></li> <li>• Discovery Ed virtual lab on sound <a href="http://streaming.discoveryeducation.com/braingame/s/iknowthat/ScienceIllustrations/sound/science_desk.cfm">http://streaming.discoveryeducation.com/braingame/s/iknowthat/ScienceIllustrations/sound/science_desk.cfm</a></li> </ul>
Pre-Assessment: <ul style="list-style-type: none"> <li>• Recall the properties of waves and how matter is affected by waves</li> </ul>	Informal Assessment: <ul style="list-style-type: none"> <li>• Vocabulary Quiz</li> <li>• Match the characteristic of sound affected by a change in each property of a wave</li> <li>• Music Connection – examine pitch and intensity of sounds produced by various</li> </ul>	

	<p>instruments</p> <ul style="list-style-type: none"> <li>• Social Studies Connection – create a timeline of sound technologies</li> <li>• Health/Writing Connection – report medical technologies that improve hearing</li> </ul>	<ul style="list-style-type: none"> <li>• Visualization on Classzone of how sound travels <a href="http://www.classzone.com/books/ml_science_share/vis_sim/wslm05_pg35_particles/wslm05_pg35_particles.html">http://www.classzone.com/books/ml_science_share/vis_sim/wslm05_pg35_particles/wslm05_pg35_particles.html</a></li> <li>• Spigot Science Magazine and teacher resource for sound <a href="http://spigotsciencemag.com/spigot-issues/sound">http://spigotsciencemag.com/spigot-issues/sound</a></li> <li>• Short video of Blue Man Group on Discovery Ed <a href="http://player.discoveryeducation.com/index.cfm?guidAssetId=4BBEB8E6-1CC4-41A8-32BA-A81CA4FC5E94&amp;blnFromSearch=1&amp;productcode=US">http://player.discoveryeducation.com/index.cfm?guidAssetId=4BBEB8E6-1CC4-41A8-32BA-A81CA4FC5E94&amp;blnFromSearch=1&amp;productcode=US</a></li> <li>• BrainPop video and lesson on sound <a href="http://www.brainpop.com/science/energy/sound/">http://www.brainpop.com/science/energy/sound/</a></li> <li>• Interactive for changing pitch and loudness of sounds <a href="http://www.sciencekids.co.nz/gamesactivities/changingsounds.html">http://www.sciencekids.co.nz/gamesactivities/changingsounds.html</a></li> </ul> <p><i>See Science Wiki for documents and more activities/resources</i></p>
<p>Post-Assessment:</p> <ul style="list-style-type: none"> <li>• Waves and Sound Test</li> <li>• Energy and Waves Unit Test</li> <li>• 2<sup>nd</sup> Quarter Assessment</li> </ul>		
<p><b>Essential Vocabulary:</b> vibration, medium, pitch, intensity</p>		
<p><b>Clarifying Objective: 6.P.3.2: Electromagnetic Waves:</b> Explain the effects of electromagnetic waves on various materials to include absorption, scattering, and change in temperature. (4)</p>		
<p><b>Student Friendly Objectives:</b></p> <ul style="list-style-type: none"> <li>• Students will recognize that the Sun is the source of nearly all electromagnetic energy on Earth.</li> <li>• Students will illustrate and sequence the electromagnetic spectrum.</li> <li>• Students will compare the types of electromagnetic radiation based on wavelength and frequency.</li> <li>• Students will examine the effects of electromagnetic waves on various materials.</li> </ul>		

Assessment/Evidence of Proficiency:		Instructional Strategies/ Resources/Informational Technology Integration:
Pre-Assessment: <ul style="list-style-type: none"><li>Breakdown the term “electromagnetic” to create a working definition</li></ul>	Informal Assessment: <ul style="list-style-type: none"><li>Vocabulary Quiz</li><li>Create a poster illustrating the em spectrum with examples</li><li>Health/Writing Connection – argue for or against the use of tanning beds (UV exposure’s effect on skin)</li><li>Report on technologies that use electromagnetic radiation</li></ul>	
Post-Assessment: <ul style="list-style-type: none"><li>EM Waves and Light Test</li><li>Energy and Waves Unit Test</li><li>2<sup>nd</sup> Quarter Assessment</li></ul>		
<b>Essential Vocabulary:</b> electromagnetic, radio waves, microwaves, infrared light, visible light, ultraviolet light, x-rays, gamma rays		
<b>Clarifying Objective: 6.P.1.2: Visible Light:</b> Explain the relationship among visible light, the electromagnetic spectrum, and sight. (8)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"><li>Students will remember that light travels straight until it strikes an object or enters a new medium. (4<sup>th</sup> Grade)</li><li>Students will identify the part of the electromagnetic spectrum that contains visible light.</li><li>Students will explain the properties of visible light.</li><li>Students will identify structures of the human eye that collect and focus light to form an image.</li></ul>		

- Students will summarize how sight is related to visible light.

Assessment/Evidence of Proficiency:		Instructional Strategies/ Resources/Informational Technology Integration:
Pre-Assessment: <ul style="list-style-type: none"><li>Recall the types of electromagnetic radiation.</li><li>Describe the location of visible light in the em spectrum.</li></ul>	Informal Assessment: <ul style="list-style-type: none"><li>Vocabulary Quiz</li><li>Match images formed to the correct type of lens/mirror (flat / convex / concave)</li><li>Health/Writing Connection – Report on medical technologies that improve sight</li></ul>	<ul style="list-style-type: none"><li>Art Connection – color-mixing related to the reflection and absorption of different wavelengths</li><li>Lenses / mirrors for demonstration of reflection and refraction</li><li>Discovery Ed virtual lab on vision <a href="http://streaming.discoveryeducation.com/braingames/iknowthat/ScienceIllustrations/eye/science_desk.cfm">http://streaming.discoveryeducation.com/braingames/iknowthat/ScienceIllustrations/eye/science_desk.cfm</a></li><li>BrainPop videos and lessons on light and the em spectrum: <a href="http://www.brainpop.com/science/energy/light/">http://www.brainpop.com/science/energy/light/</a> <a href="http://www.brainpop.com/science/energy/electromagneticspectrum/">http://www.brainpop.com/science/energy/electromagneticspectrum/</a></li></ul> <p>See Science Wiki for documents and more activities/resources</p>
Post-Assessment: <ul style="list-style-type: none"><li>EM Waves and Light Test</li><li>Energy and Waves Unit Test</li><li>2<sup>nd</sup> Quarter Assessment</li></ul>		
Essential Vocabulary: absorption, scattering, reflection, lens, mirror, convex, concave, focal point		

<b>Course Name:</b> 6 <sup>th</sup> Grade Science		<b>Strand:</b> Life Science: Living Organisms - Plants
<b>Unit Title:</b> Plants & Ecosystems		<b>Number of Days:</b> 14
<b>Essential Standard:</b> 6.L.1 – Understand the structures, processes and behaviors of plants that enable them to survive and reproduce. 6.L.2 – Understand the flow of energy through ecosystems and the responses of populations to the biotic and abiotic factors in their environment.		
<b>Clarifying Objective:</b> <b>6.L.1.1: Structures and Functions of Plants:</b> Summarize the basic structures and functions of flowering plants required for survival, reproduction and defense. (5)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"><li>Students will remember the basic structures of plants including roots, stems, leaves, and flowers. (3<sup>rd</sup> Grade)</li><li>Students will identify the structures of flowering plants including the petal, sepal, stamen, and pistil.</li><li>Students will summarize the basic functions of flowering plants.</li><li>Students will relate the structures and functions of plants to their survival, reproduction and defense.</li></ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b>
<b>Pre-Assessment:</b> <ul style="list-style-type: none"><li>Recall the basic requirements of plants for survival</li><li>Match each part of plant to how it helps the plant survive (roots take in water, etc.)</li></ul>	<b>Informal Assessment:</b> <ul style="list-style-type: none"><li>Diagram the parts of a plant</li><li>LA Connection – read/write poetry about flowers</li></ul>	<ul style="list-style-type: none"><li>Interactive plant diagram to label <a href="http://www.neok12.com/diagram/Plants-01.htm">http://www.neok12.com/diagram/Plants-01.htm</a></li><li>Spigot Science Magazine and teacher resource for plants <a href="http://spigotsciencemag.com/spigot-issues/plants">http://spigotsciencemag.com/spigot-issues/plants</a></li><li>BrainPop video on plant growth <a href="http://www.brainpop.com/science/cellularlifeandgenetics/plantgrowth/">http://www.brainpop.com/science/cellularlifeandgenetics/plantgrowth/</a></li></ul>
<b>Post-Assessment:</b> <ul style="list-style-type: none"><li>Plants Test</li><li>Plants and Ecosystems Unit Test</li><li>3<sup>rd</sup> Quarter Assessment</li></ul>		<i>See Science Wiki for documents and more activities/resources</i>
<b>Essential Vocabulary:</b> petal, sepal, stamen, anther, pollen, sperm, pistil, ovary, ovule, egg		

<b>Clarifying Objective: 6.L.1.2: Processes of Plants:</b> Explain the significance of the processes of photosynthesis, respiration, and transpiration to the survival of green plants and other organisms. (5)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"><li>Students will recall the interconnected relationship of plants and animals in ecosystems. (5<sup>th</sup> Grade)</li><li>Students will define the processes of plants including photosynthesis, respiration and transpiration.</li><li>Students will identify the requirements and products of photosynthesis and respiration.</li><li>Students will connect the processes of plants to cycles of matter in ecosystems.</li><li>Students will summarize the significance of photosynthesis, respiration, and transpiration to the survival of plants and other organisms.</li></ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b> <ul style="list-style-type: none"><li>View leaves such as elodea under the microscope to see chloroplasts</li><li>Place plastic bags tightly over the leaves on a tree branch to observe transpiration</li><li>SAS virtual lab about the carbon cycle: <a href="http://www.sascurriculumpathways.com/portal/Launch?id=952">http://www.sascurriculumpathways.com/portal/Launch?id=952</a></li></ul> <p style="text-align: center;"><i>See Science Wiki for documents and more activities/resources</i></p>
<b>Pre-Assessment:</b> <ul style="list-style-type: none"><li>Describe the ways that people/animals depend on plants for survival</li></ul>	<b>Informal Assessment:</b> <ul style="list-style-type: none"><li>Vocabulary Quiz</li><li>Diagram the relationship between photosynthesis and respiration</li><li>Report on the importance of the rain forest and the effects of cutting down large areas of trees</li></ul>	
<b>Post-Assessment:</b> <ul style="list-style-type: none"><li>Plants Test</li><li>Plants and Ecosystems Unit Test</li><li>3<sup>rd</sup> Quarter Assessment</li></ul>		
<b>Essential Vocabulary:</b> photosynthesis, respiration, transpiration, glucose, carbon dioxide, oxygen, chlorophyll, epidermis, cuticle, stomata		

<b>Clarifying Objective: 6.L.2.2: Plant Responses:</b> Explain how plants respond to external stimuli (including dormancy and forms of tropism) to enhance survival in an environment. (2)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"><li>Students will remember that environmental conditions determine how well plants survive and grow. (3<sup>rd</sup> Grade)</li><li>Students will define dormancy in plants.</li><li>Students will classify positive and negative tropisms.</li><li>Students will analyze how plants react to environmental factors to help them survive.</li></ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b> <ul style="list-style-type: none"><li>Lab experiment about tropisms: <a href="http://www.discoveryeducation.com/teachers/free-lesson-plans/the-importance-of-tropisms.cfm">http://www.discoveryeducation.com/teachers/free-lesson-plans/the-importance-of-tropisms.cfm</a></li><li>Website that has examples and videos of tropisms: <a href="http://leavingbio.net/Plant Responses.htm">http://leavingbio.net/Plant Responses.htm</a></li></ul> <p><i>See Science Wiki for documents and more activities/resources</i></p>
Pre-Assessment: <ul style="list-style-type: none"><li>Recall requirements of plants for survival</li><li>Describe need for sleep/hibernation in humans and animals</li></ul>	Informal Assessment: <ul style="list-style-type: none"><li>Vocabulary Quiz</li><li>Match each tropism to the stimulus involved</li><li>Identify periods of dormancy in plants</li></ul>	
Post-Assessment: <ul style="list-style-type: none"><li>Plants Test</li><li>Plants and Ecosystems Unit Test</li><li>3<sup>rd</sup> Quarter Assessment</li></ul>		
<b>Essential Vocabulary:</b> dormancy, phototropism, gravitropism, hydrotropism, thermotropism, thigmotropism		



<b>Course Name:</b> 6 <sup>th</sup> Grade Science		<b>Strand:</b> Life Science: Ecosystems
<b>Unit Title:</b> Plants & Ecosystems		<b>Number of Days:</b> 16
<b>Essential Standard:</b> 6.L.2 – Understand the flow of energy through ecosystems and the responses of populations to the biotic and abiotic factors in their environment.		
<b>Clarifying Objective:</b> <b>6.L.2.1: Food Chains:</b> Summarize how energy derived from the sun is used by plants to produce sugars (photosynthesis) and is transferred within food chains and food webs (terrestrial and aquatic) from producers to consumers to decomposers. (7)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"> <li>Students will remember that food provides energy for living organisms. (4<sup>th</sup> Grade)</li> <li>Students will recall that the Sun is the main source of energy for Earth. (5<sup>th</sup> Grade)</li> <li>Students will define the roles of organisms in a food chain.</li> <li>Students will describe the relationship between producers, consumers and decomposers.</li> <li>Students will examine the flow of energy between levels of organisms in food chains.</li> <li>Students will recognize that matter cycles through ecosystems while energy flows in one direction.</li> <li>Students will compare the stages and processes of the water, carbon, and nitrogen cycles.</li> </ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b> <ul style="list-style-type: none"> <li>Create a classroom “food web” using yarn to make connections between organisms (each student represents a different organism)</li> <li>BrainPop video and lessons on food chains <a href="http://www.brainpop.com/science/ecologyandbehavior/foodchains/">http://www.brainpop.com/science/ecologyandbehavior/foodchains/</a></li> <li>Visualization on Classzone about the nitrogen cycle <a href="http://www.classzone.com/books/ml_science_share/vis_sim/em05_pg20_nitrogen/em05_pg20_nitrogen.html">http://www.classzone.com/books/ml_science_share/vis_sim/em05_pg20_nitrogen/em05_pg20_nitrogen.html</a></li> <li>Reading Connection – read articles on global warming and/or the greenhouse effect</li> </ul> <p><i>See Science Wiki for documents and more activities/resources</i></p>
Pre-Assessment:	Informal Assessment:	
<ul style="list-style-type: none"> <li>Describe ways that humans acquire and use energy</li> </ul>	<ul style="list-style-type: none"> <li>Vocabulary Quiz</li> <li>Diagram the relationships between producers, consumers and decomposers</li> <li>Illustrate the stages of the carbon, water, and nitrogen cycles</li> </ul>	
Post Assessment:		
<ul style="list-style-type: none"> <li>Ecosystems Test</li> <li>Plants and Ecosystems Unit Test</li> <li>3<sup>rd</sup> Quarter Assessment</li> </ul>		

<b>Essential Vocabulary:</b> producers, consumers, decomposers, precipitation, evaporation, condensation, photosynthesis, respiration, transpiration, nitrogen fixation		
<b>Clarifying Objective:</b> <b>6.L.2.3: Biomes:</b> Summarize how the abiotic factors (such as temperature, water, sunlight, and soil quality) of biomes (freshwater, marine, forest, grasslands, desert, Tundra) affect the ability of organisms to grow, survive and/or create their own food through photosynthesis. (7)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"> <li>Students will remember the characteristics of several common ecosystems. (5<sup>th</sup> Grade)</li> <li>Students will identify biotic and abiotic factors in ecosystems.</li> <li>Students will compare the characteristics of the major land and aquatic biomes.</li> <li>Students will identify limiting factors in ecosystems.</li> <li>Students will summarize how the abiotic factors of biomes affect the ability of populations to grow, survive, and create food.</li> </ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b>
<b>Pre-Assessment:</b> <ul style="list-style-type: none"> <li>Prior knowledge of characteristics of major biomes</li> <li>Brainstorm the main components of biomes – soil, amount of water, etc.</li> </ul>	<b>Informal Assessment:</b> <ul style="list-style-type: none"> <li>Vocabulary Quiz</li> <li>Identify biomes from pictures or descriptions</li> <li>Map the location of major biomes around the world</li> <li>Create a “travel brochure” about visiting a specific biome</li> <li>Venn diagrams of similar biomes – desert &amp; grassland, temperate &amp; tropical forest, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Spigot Science Magazine and teacher resource for ecosystems <a href="http://spigotsciencemag.com/spigot-issues/ecosystems">http://spigotsciencemag.com/spigot-issues/ecosystems</a></li> <li>BrainPop video and lessons for ecosystems <a href="http://www.brainpop.com/science/ecologyandbehavior/ecosystems/">http://www.brainpop.com/science/ecologyandbehavior/ecosystems/</a></li> <li>Discovery Education interactive simulation “Pond-er This” <a href="http://player.discoveryeducation.com/views/hhView.cfm?guidAssetId=745c5f64-2c62-4d69-aeaf-078c3528e193">http://player.discoveryeducation.com/views/hhView.cfm?guidAssetId=745c5f64-2c62-4d69-aeaf-078c3528e193</a></li> <li>Discovery Education interactive simulation “Organism Needs” <a href="http://player.discoveryeducation.com/views/hhView.cfm?guidAssetId=f0d4b88e-314a-4e5b-9c76-4d2d1f85ddd4">http://player.discoveryeducation.com/views/hhView.cfm?guidAssetId=f0d4b88e-314a-4e5b-9c76-4d2d1f85ddd4</a></li> </ul>

Post-Assessment: <ul style="list-style-type: none"> <li>• Ecosystems Test</li> <li>• Plants and Ecosystems Unit Test</li> <li>• 3<sup>rd</sup> Quarter Assessment</li> </ul>	<ul style="list-style-type: none"> <li>• Experiment with plant growth under various conditions – light, temperature, water, soil</li> </ul> <p><i>See Science Wiki for documents and more activities/resources</i></p>
<b>Essential Vocabulary:</b> biotic, abiotic, biome, ecosystem, limiting factor	

<b>Course Name:</b> 6 <sup>th</sup> Grade Science		<b>Strand:</b> Earth Science: Earth Systems
<b>Unit Title:</b> Earth Systems		<b>Number of Days:</b> 32
<b>Essential Standard:</b> 6.E.2 – Understand the structure of the earth and how interactions of constructive and destructive forces have resulted in changes in the surface of the Earth over time and the effects of the lithosphere on humans.		
<b>Clarifying Objective:</b> 6.E.2.1: <b>Earth's Layers:</b> Summarize the structure of the earth, including the layers, the mantle and core based on the relative position, composition and density. (4)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"> <li>Students will recall the main features of Earth's surface. (3<sup>rd</sup> Grade)</li> <li>Students will understand that the Earth's interior is divided into four main layers based on physical characteristics.</li> <li>Students will describe and illustrate the structure of Earth's layers.</li> <li>Students will compare the properties and composition of each of Earth's layers.</li> </ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b>
<b>Pre-Assessment:</b> <ul style="list-style-type: none"> <li>Debate whether or not someone could dig through the middle of the Earth to the other side.</li> </ul>	<b>Informal Assessment:</b> <ul style="list-style-type: none"> <li>Vocabulary Quiz</li> <li>Diagram layers of the earth</li> <li>Create a chart that shows how properties of each layer change with depth</li> <li>Make an analogy between the layers of Earth and the layers of any other object (ex: egg)</li> <li>Writing Connection – write a story about traveling to the center of the Earth</li> </ul>	<ul style="list-style-type: none"> <li>BrainPop video and lessons about Earth's structure <a href="http://www.brainpop.com/science/earthsystem/earthstructure/">http://www.brainpop.com/science/earthsystem/earthstructure/</a></li> <li>SAS online exploration of Earth's layers: <a href="http://www.sascurriculumpathways.com/portal/Launch?id=67">http://www.sascurriculumpathways.com/portal/Launch?id=67</a></li> </ul> <p><i>See Science Wiki for documents and more activities/resources</i></p>

Post-Assessment: <ul style="list-style-type: none"> <li>• Plate Tectonics Test</li> <li>• Earth Systems Unit Test</li> <li>• 3<sup>rd</sup> Quarter Assessment</li> </ul>		
<b>Essential Vocabulary:</b> crust, mantle, outer core, inner core, density, composition, lithosphere, asthenosphere		
<b>Clarifying Objective: 6.E.2.2: Plate Tectonics:</b> Explain how crustal plates and ocean basins are formed, move and interact using earthquakes, heat flow and volcanoes to reflect forces within the earth. (13)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"> <li>• Students will remember that Earth’s surface is constantly changing. (4<sup>th</sup> Grade)</li> <li>• Students will recognize that the Earth’s crust consists of large movable plates.</li> <li>• Students will relate geologic activity to plate boundaries and a hot, molten mantle.</li> <li>• Students will explain how plate tectonics, earthquakes and volcanoes shape the Earth’s crust.</li> <li>• Students will classify the types of seismic waves based on how and the types of materials through which they travel.</li> </ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b>
Pre-Assessment: <ul style="list-style-type: none"> <li>• Recall the layers of Earth</li> <li>• List processes that change the surface of Earth</li> </ul>	Informal Assessment: <ul style="list-style-type: none"> <li>• Vocabulary Quiz</li> <li>• Match types of plate boundaries and faults to the direction of movement</li> <li>• Illustrate the types of volcanoes and identify what each is composed of</li> <li>• Report on the various scales that have been used throughout history to measure earthquake intensity</li> </ul>	<ul style="list-style-type: none"> <li>• Spigot Science Magazine and teacher resources for the changing earth  <a href="http://spigotsciencemag.com/spigot-issues/changing-earth">http://spigotsciencemag.com/spigot-issues/changing-earth</a></li> <li>• Discovery Ed virtual lab on earthquakes  <a href="http://streaming.discoveryeducation.com/braingames/iknowthat/ScienceIllustrations/earthquake/science_desk.cfm">http://streaming.discoveryeducation.com/braingames/iknowthat/ScienceIllustrations/earthquake/science_desk.cfm</a></li> <li>• Discovery Ed virtual lab on volcanoes  <a href="http://streaming.discoveryeducation.com/braingames/iknowthat/ScienceIllustrations/volcano/science_desk.cfm">http://streaming.discoveryeducation.com/braingames/iknowthat/ScienceIllustrations/volcano/science_desk.cfm</a></li> <li>• Have students assemble “puzzle” of Pangaea using cut-outs of the shapes of the continents</li> </ul>

	<ul style="list-style-type: none"> <li>Writing/Social Studies Connection – argue for or against the existence of Pangaea</li> </ul>	<ul style="list-style-type: none"> <li>BrainPop videos on earthquakes, volcanoes, and plate tectonics:  <a href="http://www.brainpop.com/science/earthsystem/earthquakes/">http://www.brainpop.com/science/earthsystem/earthquakes/</a>  <a href="http://www.brainpop.com/science/earthsystem/volcanoes/">http://www.brainpop.com/science/earthsystem/volcanoes/</a>  <a href="http://www.brainpop.com/science/earthsystem/plate_tectonics/">http://www.brainpop.com/science/earthsystem/plate_tectonics/</a> </li> <li>USGS website that maps recent earthquake activity and has information about earthquake hazards  <a href="http://earthquake.usgs.gov/">http://earthquake.usgs.gov/</a> </li> <li>Classzone visualization on the breakup of Pangaea  <a href="http://www.classzone.com/books/earth_science/terc/content/visualizations/es3005/es3005page01.cfm">http://www.classzone.com/books/earth_science/terc/content/visualizations/es3005/es3005page01.cfm</a> </li> <li>Volcanoes teacher’s packet with lessons and activities  <a href="http://egsc.usgs.gov/isb/pubs/teachers-packets/volcanoes/">http://egsc.usgs.gov/isb/pubs/teachers-packets/volcanoes/</a> </li> </ul> <p style="text-align: center;"><i>See Science Wiki for documents and more activities/resources</i></p>
Post-Assessment: <ul style="list-style-type: none"> <li>Plate Tectonics Test</li> <li>Earth Systems Unit Test</li> <li>3<sup>rd</sup> Quarter Assessment</li> </ul>		
<b>Essential Vocabulary:</b> tectonics, convection, subduction, convergent, divergent, transform, fault, shield, cinder-cone, composite, magma, lava		
<b>Clarifying Objective: 6.E.2.3: Rocks and Soil:</b> Explain how the formation of soil is related to the parent rock type and the environment in which it develops. (8)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"> <li>Students will remember that rocks are classified based on their composition and how they formed. (4<sup>th</sup> Grade)</li> <li>Students will identify the properties of the three main types of rock.</li> <li>Students will outline the stages and processes of the rock cycle.</li> <li>Students will relate soil formation to the rock cycle.</li> <li>Students will classify properties of soil relating to its location on Earth.</li> </ul>		

Assessment/Evidence of Proficiency:		Instructional Strategies/ Resources/Informational Technology Integration:
Pre-Assessment: <ul style="list-style-type: none"><li>• Student groups sort unknown rock samples based on criteria of their own choosing</li></ul>	Informal Assessment: <ul style="list-style-type: none"><li>• Vocabulary Quiz</li><li>• Diagram the stages and processes of the rock cycle</li><li>• Identify rock samples as sedimentary, metamorphic or igneous</li><li>• Illustrate and label a soil profile</li></ul>	<ul style="list-style-type: none"><li>• Identification of Rock samples</li><li>• Have students rotate through stations representing stages of the rock cycle</li><li>• Spigot Science Magazine and resources for rocks and minerals <a href="http://spigotsciencemag.com/spigot-issues/rocks-and-minerals">http://spigotsciencemag.com/spigot-issues/rocks-and-minerals</a></li><li>• BrainPop video and lessons on soil <a href="http://www.brainpop.com/science/earthsystem/soil/">http://www.brainpop.com/science/earthsystem/soil/</a></li><li>• Collection of rock cycle animations <a href="http://serc.carleton.edu/NAGTWorkshops/petrology/visualizations/rock_cycle.html">http://serc.carleton.edu/NAGTWorkshops/petrology/visualizations/rock_cycle.html</a></li></ul> <p><i>See Science Wiki for documents and more activities/resources</i></p>
Post-Assessment: <ul style="list-style-type: none"><li>• Rocks and Soil Test</li><li>• Earth Systems Unit Test</li><li>• 4<sup>th</sup> Quarter Assessment</li></ul>		
<b>Essential Vocabulary:</b> igneous, metamorphic, sedimentary, texture, composition, fertility, pH, erosion, weathering		
<b>Clarifying Objective:</b> <b>6.E.2.4: Stewardship:</b> Conclude that the good health of humans requires: monitoring the lithosphere, maintaining soil quality and stewardship. (2)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"><li>• Students will remember that changes to an organism’s environment can be beneficial or harmful. (4<sup>th</sup> Grade)</li><li>• Students will recognize changes to the Earth’s surface that have occurred due to human activities.</li><li>• Students will examine efforts that have been made to reduce the impact of humans on the Earth’s surface.</li><li>• Students will analyze the impact of humans on our planet’s lithosphere.</li><li>• Students will conclude that good health requires monitoring and protecting the lithosphere.</li></ul>		

Assessment/Evidence of Proficiency:		Instructional Strategies/ Resources/Informational Technology Integration: <ul style="list-style-type: none"><li>Remote sensing images of urban growth in American cities between the 1970s and 1990s <a href="http://pubs.usgs.gov/circ/2004/circ1252/">http://pubs.usgs.gov/circ/2004/circ1252/</a></li><li>Nature Conservancy Website: <a href="http://www.nature.org/ourinitiatives/urgentissues/conservationlands/index.htm">http://www.nature.org/ourinitiatives/urgentissues/conservationlands/index.htm</a></li></ul> <p><i>See Science Wiki for documents and more activities/resources</i></p>
Pre-Assessment: <ul style="list-style-type: none"><li>Describe changes that occur on the surface of Earth due to human activities</li></ul>	Informal Assessment: <ul style="list-style-type: none"><li>Vocabulary Quiz</li><li>Create thinking map about land uses</li><li>Writing Connection – argue for or against a destructive human activity such as strip mining, certain types of plowing, etc.</li></ul>	
Post-Assessment: <ul style="list-style-type: none"><li>Rocks and Soil Test</li><li>Earth Systems Unit Test</li><li>4<sup>th</sup> Quarter Assessment</li></ul>		
<b>Essential Vocabulary:</b> stewardship, lithosphere, pedosphere, remote sensing, crop rotation, contour plowing, conservation		



<b>Course Name:</b> 6 <sup>th</sup> Grade Science		<b>Strand:</b> Earth Science: Earth/Universe
<b>Unit Title:</b> Earth/Universe		<b>Number of Days:</b> 30
<b>Essential Standard:</b> 6.E.1 – Understand the earth/moon/sun system, and the properties, structures and predictable motions of celestial bodies in the Universe.		
<b>Clarifying Objective:</b> 6.E.1.1: <b>Earth/Moon/Sun Interactions:</b> Explain how the relative motion and relative position of the sun, Earth and moon affect the seasons, tides, phases of the moon, and eclipses. (9)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"> <li>Students will remember that day and night is caused by the Earth's rotation on its axis. (4<sup>th</sup> Grade)</li> <li>Students will remember that the moon's appearance changes throughout the month. (4<sup>th</sup> Grade)</li> <li>Students will illustrate the relative positions of the Earth, Moon and Sun.</li> <li>Students will examine how the motion and position of the Earth affects seasons.</li> <li>Students will recognize that both the Sun and the Moon exert a gravitational pull on the Earth.</li> <li>Students will examine how the motion and position of the Moon affects tides, eclipses, and phases of the moon.</li> </ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b>
<b>Pre-Assessment:</b> <ul style="list-style-type: none"> <li>Describe the motion of Earth related to day and night and seasons</li> <li>Describe the appearance of the moon from one night to the next</li> </ul>	<b>Informal Assessment:</b> <ul style="list-style-type: none"> <li>Vocabulary Quiz</li> <li>Identify equinoxes and solstices based on calendar date and position of the Earth and Sun</li> <li>Draw a diagram of the phases of the moon</li> <li>Match solar and lunar eclipses to the relative positions of the earth, moon and sun</li> <li>Calculate the appearance of high</li> </ul>	<ul style="list-style-type: none"> <li>Use Styrofoam balls and flashlights to model day and night and/or moon phases</li> <li>Use a water balloon to demonstrate high tide bulges</li> <li>Have students observe and record moon phases for a full month</li> <li>Classzone visualization of Moon phases <a href="http://www.classzone.com/books/earth_science/terc/content/visualizations/es2503/es2503page01.cfm">http://www.classzone.com/books/earth_science/terc/content/visualizations/es2503/es2503page01.cfm</a></li> <li>Website for moon phases and eclipses: <a href="http://stardate.org/">http://stardate.org/</a></li> <li>Lunar phases interactive: <a href="http://highered.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::800::600::/sites/dl/free/0072482621/78778/Lunar_Nav.swf::Lunar Phases Interactive">http://highered.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::800::600::/sites/dl/free/0072482621/78778/Lunar_Nav.swf::Lunar Phases Interactive</a></li> </ul>

	and low tides based on previous patterns	<ul style="list-style-type: none"> <li>BrainPop video and lesson on Moon phases <a href="http://www.brainpop.com/science/space/moonphases/">http://www.brainpop.com/science/space/moonphases/</a></li> <li>Website for eclipse interactives: <a href="http://highered.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::800::600::/sites/dl/free/0072482621/78778/Eclipses_Nav.swf::Eclipse Interactive">http://highered.mcgraw-hill.com/olcweb/cgi/pluginpop.cgi?it=swf::800::600::/sites/dl/free/0072482621/78778/Eclipses_Nav.swf::Eclipse Interactive</a></li> </ul> <p><i>See Science Wiki for documents and more activities/resources</i></p>
Post-Assessment: <ul style="list-style-type: none"> <li>Earth, Moon, and Sun Test</li> <li>Earth/Universe Unit Test</li> <li>4<sup>th</sup> Quarter Assessment</li> </ul>		
<b>Essential Vocabulary:</b> Moon, Earth, Sun, gravity, tides, axis of rotation, revolution, rotation, seasons, hemisphere, waxing, waning, gibbous, crescent		
<b>Clarifying Objective: 6.E.1.2: Solar System:</b> Explain why Earth sustains life while other planets do not based on their properties (including types of surface, atmosphere and gravitational force) and location to the Sun. (13)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"> <li>Students will remember the components of the solar system. (3<sup>rd</sup> Grade)</li> <li>Students will recall Earth's location in the solar system. (3<sup>rd</sup> Grade)</li> <li>Students will identify the properties of Earth that make it possible to support life.</li> <li>Students will compare the properties of other planets in the solar system to the properties of Earth.</li> <li>Students will conclude that the Earth is the only planet in our solar system suitable for life.</li> </ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b>
Pre-Assessment: <ul style="list-style-type: none"> <li>Label a diagram of the solar system</li> <li>List the basic necessities of human life</li> </ul>	Informal Assessment: <ul style="list-style-type: none"> <li>Vocabulary Quiz</li> <li>Create a chart comparing the characteristics of all planets in our solar system</li> <li>Create a model</li> </ul>	<ul style="list-style-type: none"> <li>Solar system web quest: <a href="http://teach.fcps.net/trt8/SolarSystem/Planets.htm">http://teach.fcps.net/trt8/SolarSystem/Planets.htm</a></li> <li>BrainPop video and lesson on Earth: <a href="http://www.brainpop.com/science/earthsystem/earth/">http://www.brainpop.com/science/earthsystem/earth/</a></li> </ul>

	<p>human colony on another planet, showing how life would be supported</p> <ul style="list-style-type: none"> <li>• Writing Connection – argue for or against the presence of life in other parts of our solar system, galaxy, or universe</li> </ul>	<ul style="list-style-type: none"> <li>• “Hunt for Alien Life” episode from NOVA <a href="http://www.pbs.org/teachers/connect/resources/7092/preview/">http://www.pbs.org/teachers/connect/resources/7092/preview/</a></li> <li>• Discovery Ed virtual lab on the solar system <a href="http://streaming.discoveryeducation.com/braingames/iknowthat/ScienceIllustrations/solarsystem/science_desk.cfm">http://streaming.discoveryeducation.com/braingames/iknowthat/ScienceIllustrations/solarsystem/science_desk.cfm</a></li> <li>• Interactive videos on Discovery Education about the planets: Inner Planets <a href="http://gtm-media.discoveryeducation.com/videos/dsc/externalApplications/interactiveVideos/index.html?vid=06">http://gtm-media.discoveryeducation.com/videos/dsc/externalApplications/interactiveVideos/index.html?vid=06</a> Parts of the Solar System <a href="http://gtm-media.discoveryeducation.com/videos/dsc//externalApplications/accessible/simulations/PartsOfOurSolarSystem/index.html">http://gtm-media.discoveryeducation.com/videos/dsc//externalApplications/accessible/simulations/PartsOfOurSolarSystem/index.html</a> Structure of the Universe <a href="http://gtm-media.discoveryeducation.com/videos/dsc//externalApplications/accessible/simulations/StructureOfTheUniverse/index.html">http://gtm-media.discoveryeducation.com/videos/dsc//externalApplications/accessible/simulations/StructureOfTheUniverse/index.html</a></li> <li>• Classzone visualization of a trip through the solar system <a href="http://www.classzone.com/books/earth_science/terc/content/visualizations/es2701/es2701page01.cfm">http://www.classzone.com/books/earth_science/terc/content/visualizations/es2701/es2701page01.cfm</a></li> <li>• Have students make travel brochure about traveling to another planet.</li> <li>• Debate whether Pluto should be a major planet.</li> </ul>
<p>Post-Assessment:</p> <ul style="list-style-type: none"> <li>• Solar System Test</li> <li>• Earth/Universe Unit Test</li> <li>• 4<sup>th</sup> Quarter Assessment</li> </ul>		<p><i>See Science Wiki for documents and more activities/resources</i></p>

<b>Essential Vocabulary:</b> planet, satellite, asteroid, meteor, comet, solar system, atmosphere		
<b>Clarifying Objective: 6.E.1.3: Space Exploration:</b> Summarize space exploration and the understandings gained from them. (3)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"><li>Students will summarize forms of space exploration.</li><li>Students will examine the information and technological spin-offs gained from space exploration.</li><li>Students will conclude that society has benefited from space exploration.</li></ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b> <ul style="list-style-type: none"><li>Spigot Science Magazine and resources about the universe <a href="http://spigotsciencemag.com/spigot-issues/the-universe">http://spigotsciencemag.com/spigot-issues/the-universe</a></li><li>Spigot Science Magazine and resources about telescopes <a href="http://spigotsciencemag.com/spigot-issues/telescopes">http://spigotsciencemag.com/spigot-issues/telescopes</a></li><li>BrainPop videos and lessons about space exploration <a href="http://www.brainpop.com/science/space/">http://www.brainpop.com/science/space/</a></li><li>Discovery Education exploration “Understanding the Universe” <a href="http://school.discoveryeducation.com/schooladventures/universe/index.html">http://school.discoveryeducation.com/schooladventures/universe/index.html</a></li><li>“When We Left Earth” documentary: <a href="http://dsc.discovery.com/tv/nasa/nasa.html">http://dsc.discovery.com/tv/nasa/nasa.html</a></li><li>NASA website about the technological spin-offs from the space program: <a href="http://spinoff.nasa.gov/">http://spinoff.nasa.gov/</a></li></ul> <p style="text-align: right;"><i>See Science Wiki for documents and more activities/resources</i></p>
Pre-Assessment: <ul style="list-style-type: none"><li>List difficulties of exploring space</li><li>Describe where our understanding of space comes from</li></ul>	Informal Assessment: <ul style="list-style-type: none"><li>Vocabulary Quiz</li><li>Create a thinking map to compare types of telescopes</li><li>Match each type of space craft to its function</li><li>Report on a technology that was developed for the space program but used in everyday life</li></ul>	
Post-Assessment: <ul style="list-style-type: none"><li>Space Exploration Test</li><li>Earth/Universe Unit Test</li><li>4<sup>th</sup> Quarter Assessment</li></ul>		
<b>Essential Vocabulary:</b> space station, telescope, flyby, orbiter, probe, lander, astronaut, space shuttle		